

# CONTENTS OF VOLUME 35

## Numbers 1 & 2

### Special Issue on Responses of Marine Organisms to Pollutants—Part 2

Editorial . . . . .	iii
Session Chairs . . . . .	v
Contents . . . . .	vii

### SECTION 6: METALS AND METAL BINDING PROTEINS

Crustaceans as Models for Metal Metabolism: I. Effects of the Molt Cycle on Blue Crab Metal Metabolism and Metallothionein . . . . . DAVID W. ENGEL & MARIUS BROUWER (USA)	1
Crustaceans as Models for Metal Metabolism: II. Induction and Characterization of Metallothionein Isoforms from the Blue Crab ( <i>Callinectes sapidus</i> ) . . . . . DANIEL SCHLENK, AMY H. RINGWOOD, THEA BROUWER-HOEXUM & MARIUS BROUWER (USA)	7
Crustaceans as Models for Metal Metabolism: III. Interaction of Lobster and Mammalian Metallothionein with Glutathione . . . . . MARIUS BROUWER, THEA BROUWER-HOEXUM & ROBERT CASHON (USA)	13
Applications of Directly Coupled SE-HPLC/ICP-MS in Environmental Toxicology Studies: A Study of Metal-Ligand Interactions in Cytoplasmic Samples . . . . . A. Z. MASON & S. D. STORMS (USA)	19
Control of Metallothionein Expression by Hormones and Stressors in Cultured Fish Cell Lines . . . . . DAVID BURGESS, NICK FRERICHs & STEPHEN GEORGE (UK)	25
Effect of Cadmium Pre-Exposure in Cadmium Accumulation by Brine Shrimp <i>Artemia</i> : Involvement of Low-Molecular-Weight Cadmium-Binding Ligands . . . . . J. DEL RAMO, M. MARTÍNEZ, A. PASTOR, A. TORREBLANCA & J. DIAZ-MAYANS (Spain)	29
Age-Specific Differences in Cadmium Sensitivity and Bioaccumulation in Bivalve Molluscs . . . . . AMY HUFFMAN RINGWOOD (USA)	35
Effect of Selected Inhibitors on Cadmium, Nickel, and Benzo(a)pyrene Uptake into Brown Cells of <i>Mercenaria mercenaria</i> . . . . . G. ZAROOGIAN, P. YEVICH & S. ANDERSON (USA)	41

Effects of Cadmium Exposure on the Ultrastructure of Hepatopancreatic Cells of <i>Thais haemastoma</i> (Gastropoda, Prosobranchia) . . . . .	47
M. REMEDIOS RUBIO, PEDRO TINEO, JAVIER DIAZ & AMPAR TORREBLANCA (Spain)	
Cytosolic Redistribution and Enhanced Accumulation of Cu in Gill Tissue of <i>Littorina littorea</i> as a Result of Cd Exposure . . . . .	53
JOSEPH R. GULLY & ANDREW Z. MASON (USA)	
Identification of Sites of Cu Accumulation and Turnover by Stable Isotopic Ratio Analysis . . . . .	59
A. Z. MASON & J. R. GULLY (USA)	
Uptake and Elimination of Tributyltin in Fish-Yolk-Sac Larvae . . . . .	65
KARL FENT & JUDITH HUNN (Switzerland)	
Effect of Sublethal Exposure to Mercury in the Biochemical Composition of Hepatopancreas in <i>Procambarus clarkii</i> during the Recovery after Starvation . . . . .	73
A. TORREBLANCA, J. DEL RAMO & J. DIAZ-MAYANS (Spain)	

#### SECTION 7: STRESS PROTEINS AND OTHER BIOCHEMICAL MARKERS

A Brief Perspective on the Heat-Shock Response and Stress Proteins . . . . .	79
LAWRENCE E. HIGHTOWER (USA)	
Are the Stress Proteins Indicators of Exposure or Effect? . . . . .	85
BRIAN P. BRADLEY (USA)	
Induction of HSP70 Proteins in Mussels by Ingestion of Tributyltin . . . . .	89
SCOTT A. STEINERT & GEORGE V. PICKWELL (USA)	
Bioindicators of Contaminant Exposure and Sublethal Effects in Benthic Fish from Puget Sound, WA, USA . . . . .	95
JOHN E. STEIN, TRACY K. COLLIER, WILLIAM L. REICHERT, EDMUNDO CASILLAS, TOM HOM & USHA VARANASI (USA)	
Biological Markers in Fish: DNA Integrity, Hematological Parameters and Liver Somatic Index . . . . .	101
J. M. EVERAARTS (The Netherlands), L. R. SHUGART, M. K. GUSTIN, W. E. HAWKINS & W. W. WALKER (USA)	
Interactive Effects of Pentachlorophenol (PCP) and Hypoxia on the Energy Metabolism of the Mussel <i>Mytilus edulis</i> . . . . .	109
W. X. WANG & J. WIDDOWS (UK)	

#### SECTION 8: IMMUNOTOXICOLOGY

In-vitro Lymphocyte Response of Bottlenose Dolphins ( <i>Tursiops Truncatus</i> ): Mitogen-Induced Proliferation . . . . .	115
GARET P. LAHVIS, RANDALL S. WELLS, DAVE CASPER & CHARLES S. VIA (USA)	

- Effects of Polycyclic Aromatic Hydrocarbons on the Lymphocyte Mitogenic Responses in Spot, *Leiostomus xanthurus* . . . . . 121  
 MOHAMED FAISAL & ROBERT J. HUGGETT (USA)

- Inhibition by Pentachlorophenol of Production of Reactive-Oxygen Intermediates by Medaka Phagocytic Blood Cells . . . . . 125  
 ROBERT S. ANDERSON & LISA L. BRUBACHER (USA)

- Effects of Laboratory Exposure to Sediments Contaminated with Polycyclic Aromatic Hydrocarbons on the Hemocytes of the American Oyster *Crassostrea virginica* . . . . . 131  
 SUSANNE SAMI, MOHAMED FAISAL & ROBERT J. HUGGETT (USA)

- Neuroendocrine Marker Expression on Sea Urchin Coelomocytes and Other Immunoregulatory Parameters May be Used to Monitor Environmental Changes . . . . . 137  
 AURELIA M. C. KOROS (USA) & ANN PULSFORD (UK)

## SECTION 9: REPRODUCTIVE TOXICOLOGY AND REPRODUCTION

- Effects of Cadmium on Gonadotropin Secretion from Atlantic Croaker Pituitaries Incubated *In Vitro* . . . . . 141  
 PETER THOMAS (USA)

- Binding of Xenobiotics to the Estrogen Receptor of Spotted Sea-trout: A Screening Assay for Potential Estrogenic Effects . . . . . 147  
 PETER THOMAS & JOHN SMITH (USA)

- Inhibition of Ovarian Microsomal Aromatase and Follicular Oestradiol Secretion by Imidazole Fungicides in Rainbow Trout . . . . . 153  
 GILLES MONOD, AMÉLIE DE MONES & ALEXIS FOSTIER (France)

- Effects of Malathion on Steroidogenesis and Sex Reversal in *Monopterus albus* . . . . . 159  
 HANUMAN SINGH (India)

- Contaminant Effects on Reproductive Success in Selected Benthic Fish . . . . . 165  
 LYNDA L. JOHNSON, EDMUNDO CASILLAS, SEAN SOL, TRACY COLLIER, JOHN STEIN & USHA VARANASI (USA)

- A Field Study of the Relationship between Bioindicators of Maternal Contaminant Exposure and Egg and Larval Viability of English Sole (*Parophrys vetulus*) . . . . . 171  
 TRACY K. COLLIER, JOHN E. STEIN, HERBERT R. SANBORN, TOM HOM, MARK S. MYERS & USHA VARANASI (USA)

- Fish-Embryo Toxicity Associated with Exposure to Soils and Sediments Contaminated with Varying Concentrations of Dioxins and Furans . . . . . 177  
 K. R. COOPER, J. SCHELL, T. UMBREIT & M. GALLO (USA)

- Passage of Xenobiotics and Their Metabolites from Hepato-pancreas into Ovary and Oocytes of Blue Crabs, *Callinectes sapidus*: Possible Implications for Vitellogenesis . . . . . 181  
 RICHARD F. LEE (USA)

- Characterizing the Annual Reproductive Cycle of *Mytilus edulis* from Boston Harbor and Cape Cod Bay—a Comparison by Means of Stereology and Condition Indices . . . . . 189  
 DEIRDRE M. KIMBALL & ANNE E. MCELROY (USA)

- Abstracts . . . . . 197

### Number 3

- Effects of Tributyltin and Dibutyltin on the Physiological Energetics of the Mussel, *Mytilus edulis* . . . . . 233  
 J. WIDDOWS (UK) & D. S. PAGE (USA)

- Effects of an Oil Spill on Some Organisms Living on Mangrove (*Rhizophora mangle* L.) Roots in Low Wave-Energy Habitats in Caribbean Panama . . . . . 251  
 S. D. GARRITY & S. C. LEVINGS (USA)

- Fate and Effects of Dispersed Crude Oil Under Icy Conditions Simulated in Mesocosms . . . . . 273  
 R. SIRON, E. PELLETIER (Canada), D. DELILLE (France) & S. ROY (Canada)

### Number 4

- San Pedro Shelf California: Testing the Pearson-Rosenberg Model (PRM) . . . . . 303  
 D. MAURER, G. ROBERTSON & T. GERLINGER (USA)

- Organic Matter Composition and Pollutant Enrichment of Sea Surface Micro-layer Inside and Outside Slicks . . . . . 323  
 F. GARABETIAN, J.-C. ROMANO, R. PAUL & J.-C. SIGOILLLOT (France)

- The Genotoxic Disease Syndrome . . . . . 341  
 B. KURELEC (Croatia)

- Effects of Ultraviolet-B Radiation on Primary Production along Latitudinal Transects in the South Pacific Ocean . . . . . 349  
 M. BEHRENFELD, J. HARDY, H. GUCINSKI, A. HANNEMAN, H. LEE & A. WONES (USA)

- Announcement . . . . . 365

- Contents of Volume 35 . . . . . 367

